Washington State Department of Health

Community Water Fluoridation Fact Sheet

Importance of Fluoride

Fluoride is a naturally-occurring mineral found in all water sources (lakes, rivers, groundwater and oceans). Community water fluoridation is the process of **adjusting** the natural fluoride concentration of fluoride-deficient water to a level recommended for optimal oral health, approximately 1 ppm (one part per million, which compares to 1 cent in $10,000). This adjustment process is similar to fortifying salt with iodine, milk with vitamin D and orange juice with vitamin C. Currently, about other 40 ingredients are added to the drinking water in the U.S. to make it palatable and safe.

Fluoride protects teeth in two ways – systemically and topically. When ingested by young children, it helps to strengthen their future teeth. But fluoride's main effect occurs after the tooth has erupted above the gum. This topical effect happens when small amounts of fluoride are maintained in the mouth in saliva and dental plaque (the film that adheres to tooth enamel). In this way, fluoride works by stopping or even reversing the tooth decay process in children and adults. It keeps the tooth enamel strong and solid by preventing the loss of important minerals.

Facts About Water Fluoridation

Fluoridation of drinking water is considered as one of the ten great public health achievements in the 20th century and has been used successfully in the United States for the last 60 years. It is the single most effective way to prevent tooth decay and improve oral health over a lifetime, for both children and adults.

Water fluoridation has helped improve the quality of life in the U.S. through reduced pain and suffering related to tooth decay, reduced time lost from school and work, and less money spent to restore, remove, or replace decayed teeth. About 170 million people (or over 2/3 of the population) in the United States are currently served by fluoridated public water systems.

Sixty years ago, Grand Rapids, Michigan became the world's first city to adjust the level of fluoride in its water supply. Since the 1950s, every Surgeon General has committed his or her support to community water fluoridation. More than 100 national and international health service agencies and professional organizations recognize the benefits of community water fluoridation in preventing dental decay.

Fluoridation of community water has been credited with reducing tooth decay by 50 to 60 percent in the United States since World War II. Today, studies prove water fluoridation continues to be effective in reducing tooth decay by 20-40%, even in an era with widespread availability of fluoride from other sources, such as fluoride toothpaste. [1,2]

Credible scientific evidence supports the use of community water fluoridation and the use of fluoride dental products for preventing tooth decay for both children and adults.

Community water fluoridation is an effective, safe, and inexpensive way to prevent tooth decay for all citizens, regardless of their age, gender or socioeconomic status.

What the Numbers Tell Us

The majority of Americans approve of water fluoridation. Results of a national survey conducted in June 1998 by the Gallup Organization showed that 73 percent in the Northeast, 72 percent in the Midwest, 68 percent in the South and 70 percent in the West favored community water fluoridation.[3] Of the 50 largest cities in our country, 43 are already fluoridated.

In the most recent scientific review of 113 articles from 23 countries (59 of which were conducted in the U.S.)[4], it was observed that water fluoridation reduced dental decay by:

- 40 to 49 percent in the primary dentition or baby teeth,
- 50 to 59 percent in the permanent teeth or adult teeth.

In a second scientific review of studies conducted from 1976 through 1987[1], reductions in dental decay in fluoridated communities were:

- 30 to 60 percent in the primary dentition or baby teeth,
- 20 to 40 percent in the mixed dentition (both baby and adult teeth – children aged 8 to 12),
- 15 to 35 percent in permanent dentition or adult teeth (adolescents aged 14-17),
- 15 to 35 percent in the permanent dentition (adults and seniors).

It has also been estimated that 51 million school hours are lost per year in U.S. because of dental-related illness.[5] Poor oral health has been related to decreased school performance, poor social relationships and less success later in life.[6]

The average cost for a community to fluoridate its water is estimated to range from approximately $0.50 a year per person in large communities to approximately $3 a year per person in small communities. For most communities, every $1 invested in water fluoridation saves $38 in dental treatment costs.[7]

Children aged 6 years or younger may develop enamel fluorosis if they ingest more fluoride than needed. Enamel fluorosis is a light, chalk-like discoloration (white spots) of tooth enamel ranging from very mild to severe forms. About 94 percent of fluorosis seen today remains largely limited to the very mild to mild categories.[8]

A review of recent studies indicated that only about 13 percent of all dental fluorosis may be attributed to water fluoridation.[9] The inappropriate use of topical fluoride-containing dental products is the largest risk factor for increased fluorosis.[10]

Parental supervision of fluoride toothpaste use among all children six years or under will limit excessive use and ingestion and can reduce the occurrence of white spots while preventing early tooth decay. Supplements and high-concentration fluoride dental products should be used judiciously and always in consultation with the child's dentist. [11]

Contact Information

Legislative:

Patty Hayes	360-236-4048
Brian Peyton	360-236-4046

News media and policy:

Maxine Hayes	360-236-3703
Joyce Lunstroth	360-236-3721

Oral Health:

Joseli Alves-Dunkerson	360-236-3524
Divesh Byrappagari	360-236-3507

Environmental Health:

Leslie Thorpe	360-236-3098
Milo Straus	360-236-3179

(Revised Nov 2005)

References

[1] Newburn E. Effectiveness of water fluoridation. J Public Health Dent 1989; 49(5):279-89.

[2] Brunelle JA, Carlos JP. Recent trends in dental caries in U.S. children and the effect of water fluoridation. J Dent Res 1990; 69(Spec Iss):723-7.

[3] American Dental Association, Survey Center. 1998 Consumers' opinions regarding community water fluoridation. Chicago; June 1998.

[4] Murray JJ. Efficacy of preventive agents for dental caries. Caries Res 1993; 27(Suppl 1):2-8.

[5] Gift HC. Oral health outcomes research: Challenges and opportunities. In Slade GD, ed., Measuring Oral Health and Quality of Life. Chapel Hill, NC: Department of Dental Ecology, University of North Carolina 1997:25-46.

[6] U.S. Genral Accounting Office. 2000. Oral Health: Dental disease is a chronic problem among low-income and vulnerable populations. Washington, DC: U.S. General Accounting Office.

[7] Griffin SO, Jones K, Tomar SL. An economic evaluation of community water fluoridation. J Public Health Dent 2001; 61(2):78-86.

[8] US Department of Health and Human Services, Public Health Service. Review of fluoride: benefits and risks. Report of the Ad Hoc Subcommittee on Fluoride. Washington, DC; February 1991.

[9] Lewis DW, Banting DW. Water fluoridation: current effectiveness and dental fluorosis. Community Dent Oral Epidemiol 1994; 22:153-8.

[10] Pendrys DG, Stamm JW. Relationship of total fluoride intake to beneficial effects and enamel fluorosis. J Dent Res 1990; 69(Spec Iss):529-38..

[11]Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. *MMWR,* August 17, 2001;50(RR-14):1–42.